

IN THE CLAIM

1 1. (Currently Amended) A method for managing a memory system having a plurality of

2 subsystems, comprising the steps of:

3 upon accessing the subsystems for a piece of data used by a first process,

4 determining ~~the~~ an access time to acquire the piece of data in the

5 memory system;

6 comparing the determined access time to a threshold; and

7 taking an action based on ~~the~~ results of the comparing step;

8 wherein

9 ~~accessing the subsystems is in a non-sequential order~~

10 a value of the threshold is selected based on whether the value is a

11 realistic time for a memory access;

12 a memory table includes entries pointing to data blocks storing data

13 for at least one subsystem;

14 the entries are used to locate the data stored in the data blocks; and

15 while the first process is being executed, the memory table working

16 with a memory manager managing the data blocks

17 independent of an operating system working with the

18 memory system and independent of a processor working

19 with the memory system.

1 2. (Currently Amended) The method of claim 1 wherein a data block[s] containing the

2 piece of data is placed in the memory system based on information selected in one

3 or a combination of:

4 a movement pattern of data in [a] the data block,

5 a structure of the memory system, and
6 a cache-level architecture in the memory system.

1 3. (Canceled)

1 4. (Canceled)

1 5. (Currently Amended) The method of claim 1 further comprising the steps of:

2 ~~using a memory table having entries pointing to data blocks storing data~~
3 ~~for the memory system; and~~
4 the memory table using a physical address of a memory page
5 corresponding to the piece of access data to convert to a location
6 address corresponding to an entry pointing to the location of the
7 piece of access data.

1 6. (Currently Amended) A method for managing a memory system, comprising the steps
2 of:

3 upon accessing the memory system for a piece of data used by a first
4 process,
5 a processor working with the memory system continuing its
6 functions until it is stalled;
7 comparing the a time taken to complete the memory access to a
8 threshold; and
9 ~~if the time taken to complete the memory access is close to, equal~~
10 ~~to, or greater than the threshold, then taking an action based~~
11 on results of the comparing step; a value of the threshold

12 being selected based on whether the value is a realistic time
13 for a memory access.

1 7. (Original) The method of claim 6 wherein the action is selected in one or a combination
2 of
3 postponing executing the first process and allowing executing a second
4 process;
5 causing the first process to be switched to a second process; and
6 causing a performance monitor on the memory system or on a system
7 using the memory subsystem.

1 8. (Original) The method of claim 6 further comprising the step of polling a latency
2 manager for the time taken to complete the memory access; the latency manger
3 being part of managing the memory system.

1 9. (Currently Amended) The method of claim 6 further comprising the steps of:
2 using a memory table having entries pointing to data blocks storing data.
3 for at least one subsystem; and
4 using the entries to locate the access data stored in the data blocks.

1 10. (Currently Amended) The method of claim 9 wherein, while the first process is being
2 executed, the memory table working with a memory manager managing the data
3 blocks independent of a processor working with the memory system and
4 independent of an operating system working with the memory system.

1 11. (Currently Amended) A method for managing a memory system, comprising the
2 steps of:
3 upon accessing the memory system for a piece of data used by a first
4 process
5 counting a time elapsed from the time the data access starts; the
6 counted time being increased as the data is being accessed;
7 comparing the counted time to a threshold; a value of the threshold
8 is selected based on whether the value is a realistic time for
9 a memory access; and
10 ~~if the counted time is close to, equal to, or greater than the~~
11 ~~threshold, then~~ based on results of the comparing step, taking an
12 action selected in one or a combination of
13 postponing executing the first process and allowing
14 executing a second process;
15 causing the first process to be switched to a second process;
16 and
17 causing a performance monitor on the memory system or on
18 a system using the memory system.

1 12. (Original) The method of claim 11 further comprising the steps of:
2 using a memory table having entries pointing to data blocks storing data
3 for at least one memory subsystem; and
4 using the entries to locate the access data stored in the data blocks.

1 13. (Currently Amended) A computer-readable medium embodying instructions for a
2 computer to perform a method for managing a memory system having a plurality
3 of subsystems, the method comprising the steps of:

4 upon accessing the subsystems for a piece of data used by a first process,
5 determining ~~the~~ an access time to acquire the piece of data in the
6 memory system;

7 comparing the determined access time to a threshold; and

8 taking an action based on ~~the~~ results of the comparing step;

9 wherein

10 ~~accessing the subsystems is in a non-sequential order~~

11 a value of the threshold is selected based on whether the value is a

12 realistic time for a memory access;

13 a memory table includes entries pointing to data blocks storing data

14 for at least one subsystem;

15 the entries are used to locate the data stored in the data blocks; and

16 while the first process is being executed, the memory table working

17 with a memory manager managing the data blocks

18 independent of an operating system working with the

19 memory system and independent of a processor working

20 with the memory system.

1 14. (Currently Amended) The computer-readable medium of claim 13 wherein a data
2 block[s] containing the piece of data is placed in the memory system based on
3 information selected in one or a combination of:

4 a movement pattern of data in [a] the data block,

5 a structure of the memory system, and

6 a cache-level architecture in the memory system.

1 15. (Canceled)

1 16. (Canceled)

1 17. (Currently Amended) The computer-readable medium of claim 13 wherein the method

2 further comprises the steps of:

3 ~~using a memory table having entries pointing to data blocks storing data~~

4 ~~for the memory system; and~~

5 the memory table using a physical address of a memory page

6 corresponding to the piece of access data to convert to a location

7 address corresponding to an entry pointing to the location of the

8 piece of access data.

1 18. (Currently Amended) A computer-readable medium embodying instructions for a

2 computer to perform a method for managing a memory system, the method

3 comprising the steps of:

4 upon accessing the memory system for a piece of data used by a first

5 process,

6 a processor working with the memory system continuing its

7 functions until it is stalled;

8 comparing the a time taken to complete the memory access to a

9 threshold; a value of the threshold being selected based on

10 whether the value is a realistic time for a memory access;

11 and

12 ~~if the time taken to complete the memory access is close to, equal~~
13 ~~to, or greater than the threshold, then~~ based on results of the
14 comparing step, taking an action.

1 19. (Original) The computer-readable medium of claim 18 wherein the method further
2 comprises the step of polling a latency manager for the time taken to complete the
3 memory access; the latency manger being part of managing the memory system.

1 20. (Currently Amended) The computer-readable medium of claim 18 wherein the method
2 further comprises the steps of:
3 using a memory table having entries pointing to data blocks storing data
4 for at least one subsystem; and
5 using the entries to locate the aeeess data stored in the data blocks.

1 21. (Currently Amended) A computer-readable medium embodying instructions for a
2 computer to perform a method for managing a memory system, the method
3 comprising the steps of:
4 upon accessing the memory system for a piece of data used by a first
5 process,
6 counting a time elapsed from the time the data access starts; the
7 counted time being increased as the data is being accessed;
8 comparing the counted time to a threshold, a value of the threshold
9 being selected based on whether the value is a realistic time
10 for a memory access; and

11 ~~if the counted time is close to, equal to, or greater than the~~
12 ~~threshold, then~~ based on results of the comparing step, taking an
13 action selected in one or a combination of
14 postponing executing the first process and allowing
15 executing a second process;
16 causing the first process to be switched to a second process;
17 and
18 causing a performance monitor on the memory system or on
19 a system using the memory subsystem.

1 22. (Currently Amended) The computer-readable medium of claim 21 wherein the method
2 further comprises the steps of:
3 using a memory table having entries pointing to data blocks storing data
4 for at least one memory subsystem; and
5 using the entries to locate the ~~access~~ data stored in the data blocks.

1 23. (Currently Amended) An apparatus for managing a memory system having a plurality
2 of subsystems, comprising:
3 means for, upon accessing the subsystems for a piece of data used by a first
4 process,
5 determining the an access time to acquire the piece of data in the
6 memory system;
7 comparing the determined access time to a threshold; and
8 taking an action based on ~~the~~ results of the comparing step;
9 wherein
10 ~~accessing the subsystems is in a non-sequential order~~

11 a value of the threshold is selected based on whether the value is a
12 realistic time for a memory access;
13 a memory table includes entries pointing to data blocks storing data
14 for at least one subsystem;
15 the entries are used to locate the data stored in the data blocks; and
16 while the first process is being executed, the memory table working
17 with a memory manager managing the data blocks
18 independent of an operating system working with the
19 memory system and independent of a processor working
20 with the memory system.

1 24. (Currently Amended) The apparatus of claim 23 wherein a data block[s] containing
2 the piece of data is placed in the memory system based on information selected in
3 one or a combination of:
4 a movement pattern of data in [a] the data block,
5 a structure of the memory system, and
6 a cache-level architecture in the memory system.

1 25. (Canceled)

1 26. (Canceled)

1 27. (Currently Amended) The apparatus of claim 23 ~~further comprising a memory table~~
2 ~~having entries pointing to data blocks storing data for the memory system; wherein~~
3 the memory table using a physical address of a memory page corresponding to the

4 piece of access data to convert to a location address corresponding to an entry
5 pointing to the location of the piece of access data.

1 28. (Currently Amended) An apparatus for managing a memory system, comprising:
2 upon accessing the memory system for a piece of data used by a first
3 process,
4 a processor for working with the memory system and for
5 continuing its functions until it is stalled;
6 means for comparing the a time taken to complete the memory
7 access to a threshold; a value of the threshold being selected
8 based on whether the value is a realistic time for a memory
9 access; and
10 means for taking an action ~~if the time taken to complete the~~
11 ~~memory access is close to, equal to, or greater than the~~
12 ~~threshold~~ based on results of comparing.

1 29. (Original) The apparatus of claim 28 further comprising means for polling a latency
2 manager for the time taken to complete the memory access; the latency manager
3 being part of managing the memory system.

1 30. (Currently Amended) The apparatus of claim 28 further comprising a memory table
2 having entries pointing to data blocks storing data for at least one subsystem; the
3 entries being used to locate the access data stored in the data blocks.

1 31. (Currently Amended) An apparatus for managing a memory system, comprising:

2 upon accessing the memory system for a piece of data used by a first
3 process,
4 means for counting a time elapsed from the time the data access
5 starts; the counted time being increased as the data is being
6 accessed;
7 means for comparing the counted time to a threshold, a value of the
8 threshold being selected based on whether the value is a
9 realistic time for a memory access; and
10 ~~if the counted time is close to, equal to, or greater than the~~
11 ~~threshold,~~ means for taking an action selected in one or a
12 combination of
13 postponing executing the first process and allowing
14 executing a second process;
15 causing the first process to be switched to a second process;
16 and
17 causing a performance monitor on the memory system or on
18 a system using the memory subsystem.

1 32. (Currently Amended) The apparatus of claim 31 further comprising a memory table
2 having entries pointing to data blocks storing data for at least one memory
3 subsystem; the entries being used to locate the access data stored in the data
4 blocks.

1 33. (New) The method of claim 5 wherein the physical address of the memory page is
2 converted from a virtual address of the piece of data.

1 34. (New) The computer-readable medium of claim 17 wherein the physical address of
2 the memory page is converted from a virtual address of the piece of data.

1 35. (New) The apparatus of claim 27 wherein the physical address of the memory page is
2 converted from a virtual address of the piece of data.